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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,938	11/13/2003	Joseph D. Rigney	041A.0008.U1(US)	4781

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HARRINGTON & SMITH, PC  
4 RESEARCH DRIVE  
SHELTON, CT 06484-6212

EXAMINER
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SAVAGE, JASON L

ART UNIT	PAPER NUMBER
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1775

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/28/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/713,938

Applicant(s)

RIGNEY ET AL.

Examiner

Jason L. Savage

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 14-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as obvious over Rigney et al. (US 6,153,313).

Rigney teaches a low growth environmental bond coating which is applied directly to a base metal substrate comprising an alloy having an aluminum content of about 30-60 atomic percent (col. 3, ln. 35-60). Rigney teaches this low growth environmental bond coating interacts to form a diffusion zone with the substrate, however the diffusion zone is limited so that upon subsequent repair of the component, the thickness of the base metal that must be removed will be minimized (col. 5, ln. 33-52). Rigney further teaches that the diffusion zone is preferably less than 0.2 mils (ie 5 micrometers) (col.5, ln. 36-40).

Although Rigney does not exemplify a repair process, it would have been within the purview of one of ordinary skill in the art to have employed a conventional repair/refurbishment process on the component coated with the bond coat of Rigney with a reasonable expectation of success. As such, although Rigney does not explicitly recite the claimed method steps in a repair process, an artisan seeking to refurbish the component having the coating of Rigney would employ the recited steps of removing the bond coat and a portion

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of the base metal substrate, applying a low growth bond coating such as the one taught by Rigney which would interact to form another diffusion zone although it would be limited in depth resulting in increased repairability of the component.

Regarding the limitation that 'a lower growth (emphasis added) environment bond coating is applied, Applicant has not defined what constitutes a lower growth coating. Should Applicant intend that the lower growth coating results in a diffusion zone having a decreased depth in comparison to the prior coating which was removed, it would have been obvious to one of ordinary skill in the art to have refurbished a component having a different bond coating composition and subsequently applied the bond coat of Rigney during the repair of the component. One would have been motivated to use the coating of Rigney over the prior bond coat with the expectation that the refurbished component would exhibit improved diffusional resistance thus increasing component life.

Regarding claim 2, Rigney would meet the claim limitation that no more than 1 mil of the substrate would need to be removed in subsequent repair cycles.

Regarding claim 3, it would have been within the purview of one of ordinary skill in the art to have recognized that such a repair process could be employed components having any kind of bond coat with a reasonable expectation of success including diffusion bond coatings.

Regarding claims 4, 6 and 8, the integrated aluminum level in the bond coating of Rigney would be within the range claimed by Applicant since the aluminum concentration of the aluminum layer is within the claimed range and

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the bond coating thickness is approximately 15 micrometers (col. 5, ln. 26-31) which is substantially less than the thicknesses which were employed to achieve the integrated aluminum levels greater than the claimed values.

Regarding claim 5, Rigney teaches that the bond coating is a  $\beta$ -NiAl coating (col. 5, ln. 19-30).

Regarding claim 7 and 9, the coating of Rigney may be a MCrAlY coating wherein M is selected from Ni (col. 7, Table I).

Regarding claim 10, the component from a turbine engine (col. 4, ln. 40-46).

Regarding claims 11-13, although Rigney is silent as to refurbishing a used component which previously employed a PtAl aluminide diffusion bond coat, absent a teaching of the criticality or showing of unexpected results, it would not provide a patentable distinction over the prior art. It would have been within the purview of one of ordinary skill in the art to have recognized that the bond coating of Rigney could be employed as the bond coat for a repaired component regardless of what material was previously used as the bond coat.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as obvious over Rigney et al. (US 6,153,313) in view of Rosenzweig et al (EP 1 123 987).

Rigney teaches an inventive low growth environment bond coating and while it states that the coating will improve the repairability of the component, it is does not exemplify a embodiment wherein a component is repaired.

Rosenzweig teaches a method of repairing a turbine engine component wherein the bond coat is removed from the base metal substrate which also results in the removal of a portion of the base metal substrate causing a reduction in the thickness (par. [0008]). Rosenzweig further teaches that a low growth environmental bond coating is applied which serves to extend the life of the component and repairability of the component (par. [0009-0010]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have taken the improved bond coating of Rigney and used them in repair processes such as those taught by Rosenzweig. One would have been motivated to employ the coating of Rigney over the prior bond coat with the expectation that the refurbished component would exhibit improved diffusional resistance thus increasing component life.

Regarding the limitation of the initial reduction of thickness in the substrate component in step b) is limited to between about 1-3 mils in thickness, Rosenzweig teaches that the initial bond coat may grow to a thickness of between 2-3 mils due to consumption of the substrate (par. [0004]). As such, Rosenzweig meets the limitation that when the initial bond coating is removed, the substrate thickness is reduced in thickness in an amount within the claimed range. In the alternative, since Rosenzweig does not explicitly recite the reduction in thickness of the base metal substrate once the coatings are removed, it would have been obvious to one of ordinary skill in the art to have

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attempted to limit the reduction in substrate thickness to as little as possible which would fall within the range claimed.

Regarding the limitation that the reduction in thickness of the substrate in subsequent repair cycles in step c) will be less than 1-3 mils in thickness, Rosenzweig teaches that the newly applied bond coat can be removed without consumption of any of the substrate layer and thus would meet the claim limitation (par. [0010]).

Regarding the limitation that the aluminum content is between 10-60 at% in step c), Rosenzweig teaches the aluminum content falls within the claimed range (Table 1).

Regarding claim 2, Rosenzweig meets the claim limitation of no more than 1 mil of the substrate is removed in subsequent repair cycles.

Regarding claim 3, the formed aluminide bond coat of Rosenzweig is a diffusion bond coating.

Regarding claims 4, 6 and 8, the integrated aluminum level in the bond coating of Rosenzweig would be less than that claimed by Applicant since the aluminum concentration is always less than the aluminum contents (i.e. 38% or more as recited in the specification, page 16, ln. 1-34) which would be necessary to produce values higher than what is claimed.

Regarding claim 5, Rosenzweig teaches that the bond coating may comprise NiAl (par. [0016]). Although Rosenzweig does not specifically recite the NiAl in the coating comprises  $\bar{\square}$ NiAl, such compounds would be inherent. The Patent and Trademark Office can require Applicant to prove that prior art

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products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on Applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best*, *Bolton*, and *Shaw*, 195 U.S.P.Q. 431 (CCPA 1977).

Regarding claim 7 and 9, the coating of Rosenzweig is a MCrAlY coating wherein the Y content is zero and M is selected from Ni, Fe and Co (Table 1).

Regarding claim 10, the component is a turbine engine (par. [0008]).

Regarding claims 11-13, the environmental bond coating is a aluminide diffusion bond coating which may comprise PtAl (par. [0013 and 0017]).

Claims 1-3 and 10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Conner et al. (US 6,305,077).

Conner teaches a method for repairing a used coated turbine component by:

- a) providing the turbine engine component wherein the base metal substrate having a thermal barrier and bond coat thereon,
- b) removing the various coating the on the substrate

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c) forming a low growth aluminide environmental bond coating which serves to extend the life of the component and repairability of the component (col. 1, ln. 54 – col. 2, ln. 60).

Regarding the limitation that there is an initial reduction in thickness of the substrate component in step b), although Conner is silent as to this thickness reduction and the extent of the thickness lost, given that the bond coating thicknesses are fairly standard for coated turbine engine components, one could reasonably expect that the reduction in substrate thickness would be similar to that claimed by Applicant.

Regarding the limitation that the reduction in thickness of the substrate in subsequent repair cycles in step c) will be less than 1-3 mils in thickness, since Conner teaches the formation of an aluminide diffusion bond environmental coating just as is taught and claimed by Applicant, one could reasonably expect that the reduction in substrate thickness would be within the range claimed by Applicant. In the alternative, it would have been within the level of one of ordinary skill in the art to have recognized that minimizing the reduction of substrate thickness in future repair cycles would have been desirable.

Claims 6, 8, 9 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conner et al. (US 6,305,077).

Conner teaches what is set forth above but is silent to the integrated aluminum level being within the ranges claimed in claims 6 and 8. However, Conner teaches the diffused aluminide environmental bond coating has a

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thickness of between 50 microns to 100 microns, it is the position of the Examiner that it would have an integrated aluminum level well within the range claimed.

Regarding claims 9 and 11-13, the aluminide diffusion coating comprises Al and a noble metal such as Pt (col. 2, ln. 15-43).

***Prior Art Made of Record but not Relied Upon***

The following is a listing of prior art made of record but not relied upon for the rejections above:

Das'870 (US 6,560,870) teaches a method for repairing a used coated turbine wherein a diffusion aluminide environmental bond coating is applied to repair a damaged area in the existing bond coating (col. 2, ln. 36-67). Das'870 further teaches that the environmental bond coating may be an alloy containing between 50-60% aluminum and may be alloyed with a wide variety of metals (col. 4, ln. 1-40).

***Response to Arguments***

Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Savage whose telephone number is 571-272-1542. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jason Savage  
2-16-07



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2/20/07